The Evolution of TTCN-3 as a Language
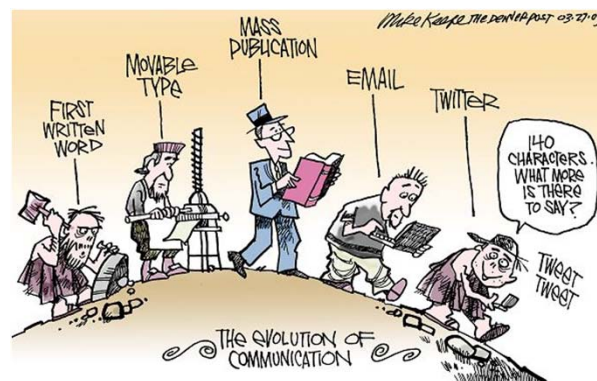
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What is Evolution?

○ Evolution is the process of change in all forms of life over generations.

What is Evolution?

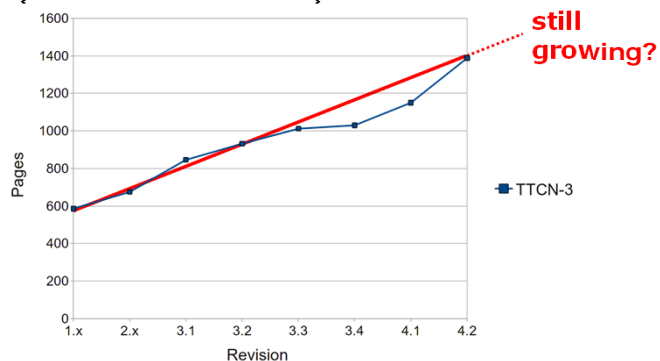- Evolution is the process of change in **TTCN-3 over versions.**

Evolution of Standard Size

- From 589 to 1388 pages (increase of 237%)

still growing?

Evolution of Size per Part

Composition of the Standard

1.x

4.2

○ From 5 to 14 parts
○ Part 6 is larger than Part 1
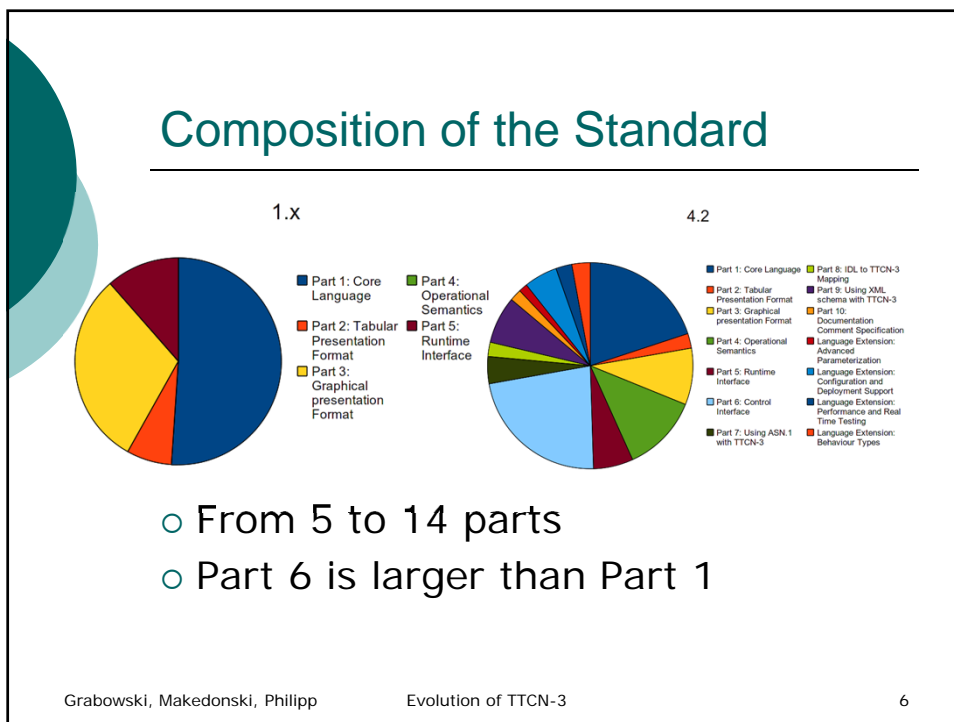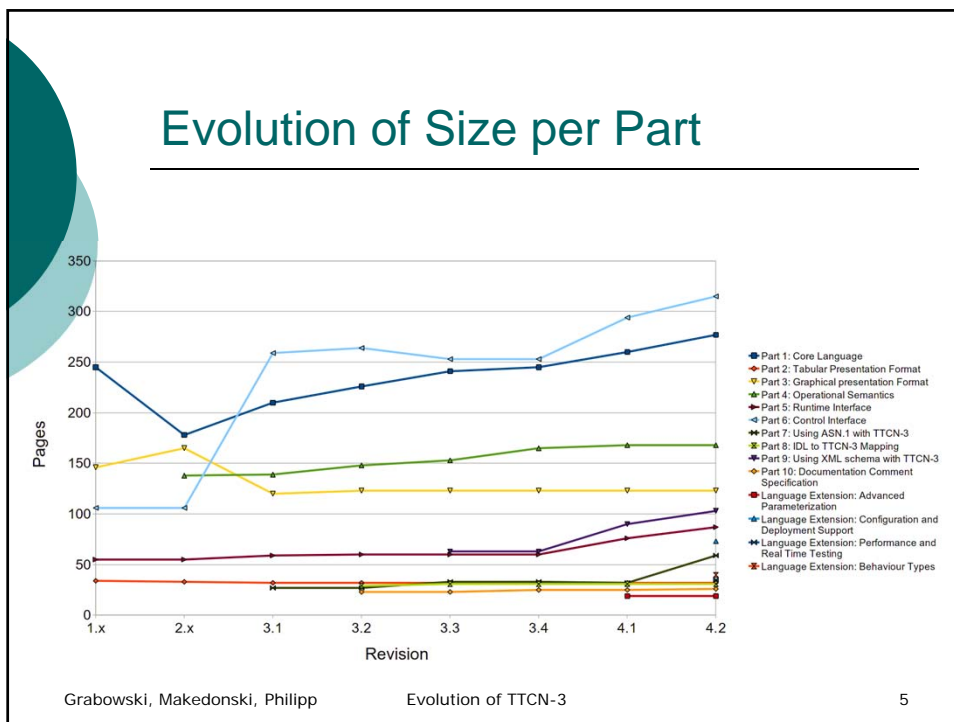
Evolution of the Core Language: Changes

○ Levenshtein distance

is defined as the minimum number of edits needed
to transform one string into the other
(with the allowable edit operations being insertion,
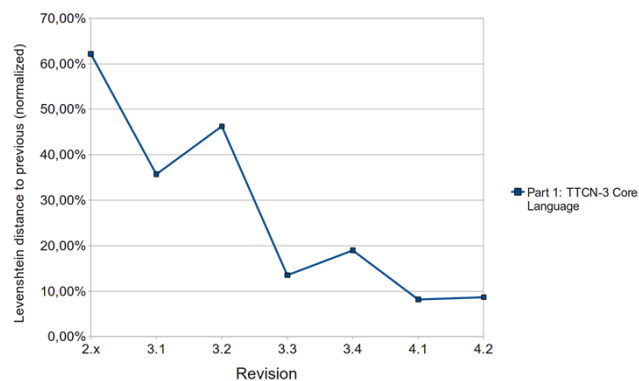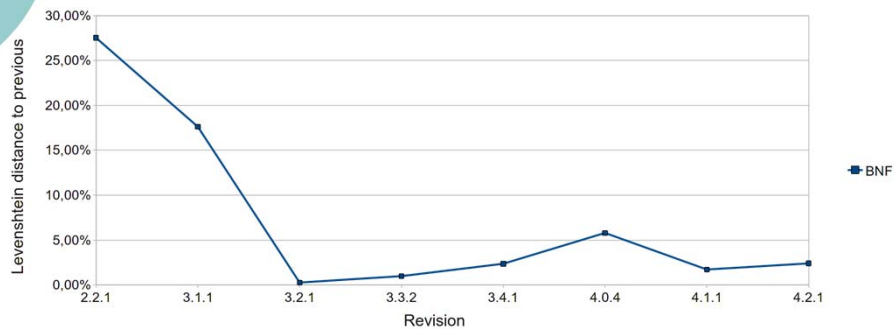deletion, or substitution of a single character).

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Evolution of the Core Language: Changes

○ Levenshtein distance

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Evolution of the Core Language: Changes in BNF

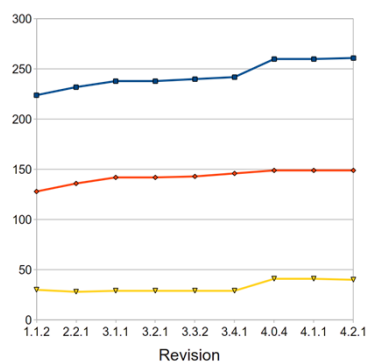○ Levenshtein distance

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Evolution of the Core Language: Number of Terminal Symbols

○ Literals
- All terminal symbols

○ Keywords
- Alphanumeric terminal symbols at least two characters long (e.g., **send**, **receive**, **module**, **testcase**, …)

○ Symbols
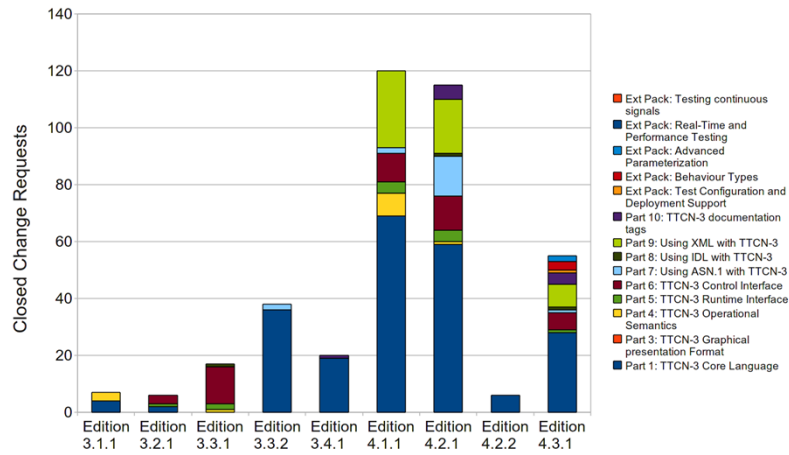- Terminal symbols that contain no alphanumeric characters (e.g., **+**, **-**, **:=**, **?**, *****, …)

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Evolution of Change Requests

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Top 10 Change Request Authors
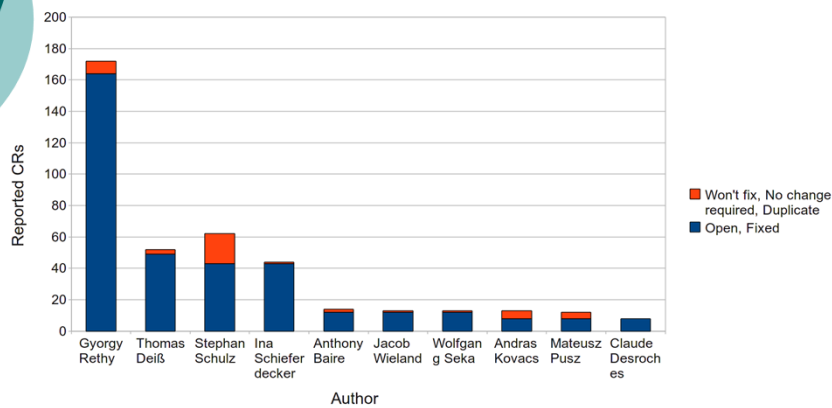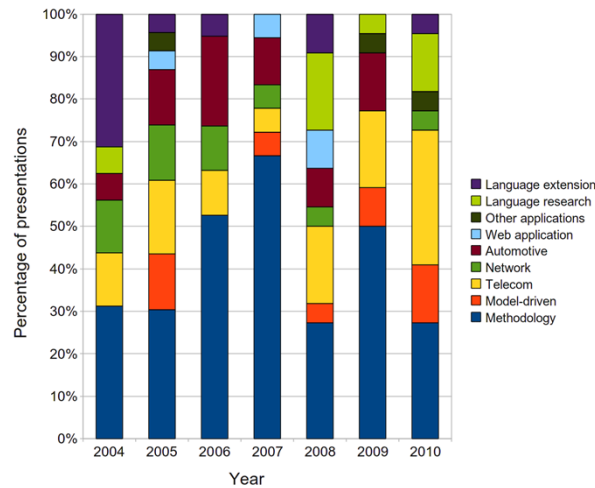

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Evolution of TTCN-3 Conference Topics
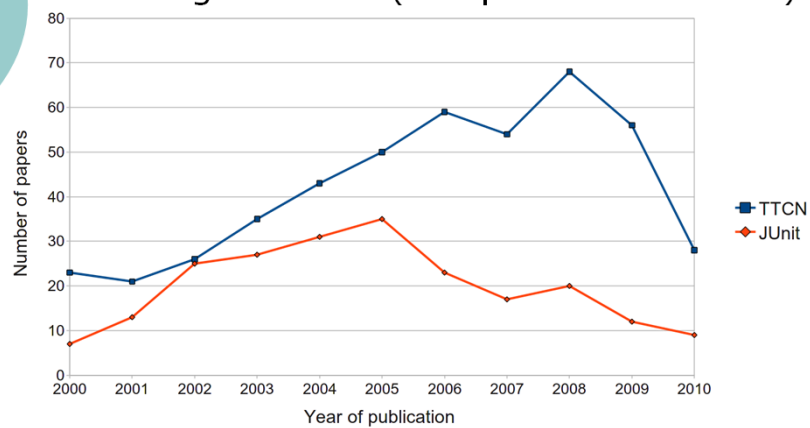

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Evolution of Articles with TTCN-3 in their Heading

○ Google Scholar (Comparison with JUnit)

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Conclusions

○ Data shows that TTCN-3 has become a mature and stable testing technology.

○ Main application areas showing up since the birth of TTCN-3 seem to be (Tele-)Communications and Automotive.
  ● Other areas like Avionics, Medicine, etc. only show up sporadically.

○ Language is still growing!
  ● Growth is "hidden" in extension packages.
  ● Extension packages adapt TTCN-3 to different "test situations".

○ Methodology is still needed!

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… and the Future (1)

○ We believe that TTCN-3 …
  ● survives (at least) another decade!
  ● stays the predominant testing technology for all kinds Black-Box testing over standardized or open interfaces.

○ Short term issues:
  ● Complexity of the language
    ○ Simplification?
      ● Candidates: **friend**, **getcall**, **halt**, **noblock**, **nowait**
  ● Identification of the role of TTCN-3 in
    ○ Agile development
    ○ Model-based testing

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… and the Future (2)

○ Long term issues:
- TTCN-4 ?
  - ○ Requires a new and strong trend in Software Engineering (and test development).
  - ○ One direction might be the development of domain specific test languages instead of having one "general purpose test language".

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○ Thank you for your attention

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